ORIGINAL ARTICLE

Frequency of Mode and Grade of Retroperitoneal Organ Injuries following Blunt Abdominal Trauma

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ABSTRACT

Aim: To determine the frequency of mode and grade of retroperitoneal organs (kidney, duodenum and pancreas) injuries following blunt abdominal trauma.
Methods: It was a cross sectional study and conducted at Department of Surgery, DQH Teaching Hospital, Sahiwal from July 2014 to January 2015. Total 110 subjects with history of blunt trauma abdomen and undergoingexploratory laparotomy were included in the study.
Results: Total 110subjects having history of blunt trauma abdomen were enrolled.The mean age of subjects was36.11±12.57 years. Males were 92(83.64%), the females were 18(16.36%). Total 64 (58.18%) subjects suffered from Road Accidents, 29(26.36%) suffered from fall from height and 17(15.46%) found with history of physical assault.Pancreas was injured in 28(25.45%), Duodenum in 30(27.27%), kidney in 34(30.91%) and 18(16.365%) had pancreatoduodenal injuries.
Conclusion: In this study road accidents were the most common cause of blunt abdominal trauma and most of the subjects were found with injury of kidney.This study highlights the need for prioritizing a public healthapproach to abide by traffic laws and violence prevention in Pakistan.Results of this study also reveals that male subjects were more victim of blunt abdominal trauma as compare to female subjects and age group 12-35 years was the most common age group of cases with blunt abdominal trauma.
Keywords: Blunt Trauma. Retroperitoneal Organs. Road Traffic Accidents. Laparotomy.

INTRODUCTION

Trauma is one of the leading preventable cause of mortality in Pakistan like other developing countries[1]. In Pakistan accidental trauma ranked four among the chief causes of death. Trauma accounts for 8% of all the deaths in our country. About 140,000 individuals die in accidents, and approximately double the number are disabled yearly[2].

Trauma is defined as damage to the body by exchange withenvironmental energy that is beyond body's resilience. Trauma is one of the most common cause of death and disability in the age of 12-60years[3,4]. Due to large surface area, abdomen iscommonly injured regions of the body5. The retroperitoneum is that portion of the abdomen whichisseparated from the peritoneum anteriorly by the posterior peritoneal fascia and isbounded posteriorly by the fascia transversalis. It contains portions of the colon and duodenum as well as the pancreas, kidneys, adrenal glands, abdominal aorta, and inferior vena cava (IVC). Nearly 75% of abdominal trauma follows blunt injury[6]. Abdominal trauma is usually associated injuries like head injury, chest trauma and bony injury. Moreover, the decision to perform laparotomy for blunt abdominal trauma is more complex and difficult, as structuralinjury being less obvious.

The retroperitoneum is one of the most challenging areas of theabdomen.[7] Injuries of the retroperitoneal organs occur mainly in patients withpolytrauma[8]. Retroperitoneal injuries are among the most lethal injuries sustained bytrauma patients and the most common modes of injury are road accidents, physical assault, fall from height and animal hits[9]. Retroperitoneal organ injuries are known to occur in a significant minority of blunt abdominal trauma cases[10].
In Sahiwal, trauma is one of the common reason for hospital admission. So, a study is planned to see the pattern of retroperitoneal injuries following blunt trauma abdomenpresenting at DQH Teaching Hospital Sahiwal.

MATERIAL AND METHODS

It was a cross sectional study and conducted at Department of Surgery, DQH Teaching Hospital, Sahiwal from July 2014 to January 2015.Total 110 consecutive cases sustaining blunt trauma abdomen were included in this study. Approval was taken from institutional review committee and written informed consent was taken from every patient. All patients either male or female having age 12 to 60 years,

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presenting with historyof blunt trauma abdomen and undergoing exploratory laparotomy were includedin the study. The diagnosis of blunt abdominal trauma was made on the basis ofpresence of tenderness, rigidity, and bruise on the abdominal wall. Patientspresenting within 12 hours of sustaining injury will be included in the study.Patients managed non-operatively, patients suffering from any kind of penetrating abdominal injury and moribund patients of ASA-5 were excluded from the study.

Demographic profile of all the subjects was entered in pre-designed poforma. Mode of injury and intra-abdominalinjuries involving the kidney, duodenum and pancreas were noted. The scale devised by the Organ InjuryScaling Committee of the American Association for the Surgery of Trauma wasused to grade the injuries to various organs. Grading of injuries was verified byattending consultant.

Data was analyzed by using SPSS version 17. Mean and SD was calculated for numerical data. Frequencies and percentages were calculated for categorical data. Chi square test was used as a test of association. P. value 0.05 was considered as significant.

RESULTS

Total of 110 subjects who suffered from blunt trauma abdomenpresented at the Department of Surgery Sahiwal Hospital, Sahiwal were included this study. Mean age of the subjects was 36.11±12.57 years.
Among the 110 subjects mode of injury was: Physical Assault 17(15.45%), Fall from height 29(26.36%) Road Accidents 64(58.18%) (Fig. 1).

As shown in table 1, pancreas was injured in 28(25.45%) subjects and Grade I, II, III IV and V injuries were seen in 7(25%), 10(35.7%), 7(25%), 3 (10.7%) and 1(3.4%) respectively. In 30(27.27%) subjects duodenum was injured followed by Grade I, II, III and IV injuries were seen in 5 (16.67%), 15(50%), 8(26.27%), 2(6.8%) respectively and Grade IV injury was not seen in any subject. Out of 34(30.91%) subjects with injured kidney Grade I, II, III IV and V injuries were seen in 4(11.8%), 10(29.4%), 10(29.4%), 6(17.6%) and 4(11.8%) subjects.

Stratification of mode of injury in relation to gender was done. Out of 64(58.18%) subjects injured with road accents 53(82.81%) was male and 11(17.19%) was female. Among the 29(26.36%) subjects injured due to fall from height, 24(82.76%) was male and 5(17.24%) was female and subjectsinjured with physical assault 17(15.46%), male was 15(88.24%) and female was 2(11.76%). No association was seen between mode of injury and gender. P value 0.857 (Table 2).

Stratification for age was done. Out of 64 (58.18%) subjects of road accident, 38(59.38%), 21(32.81%) and 5(7.8%) subjects belonged to age group 12-15 years, 36-50 years and 51-70 years respectively. Out of 29(26.36%) injured with fall from height, 17(58.62%) belonged to age group 12-35 years, 8(27.59%) 26-50 years and 4(13.8%) belonged to 51–70 years age group. Subjectshaving history of physical assault was 17(15.46%), 14(63.64%) belonged to age group 12-35 years, 4(18.18%) to age group 36-50 years and 4(18.8%) subjects belonged to age group 51-70 years. No association was seen between mode injury and age group P. value 0.546 (Table 3).

Fig. 1: Mode of injury

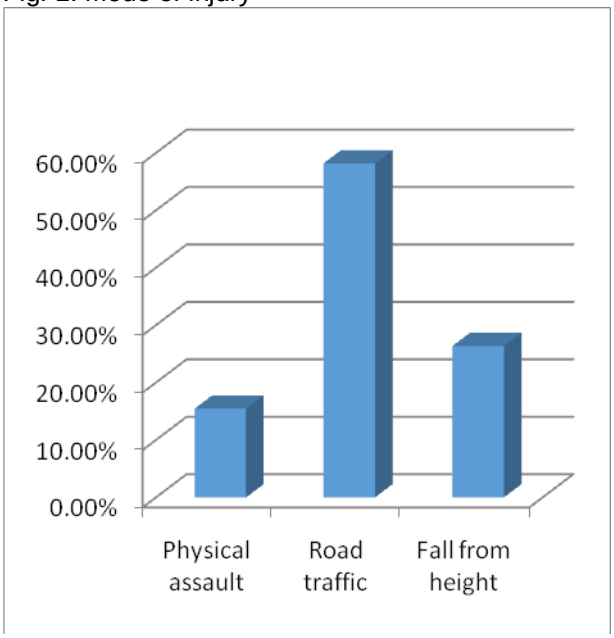

Table 1: Organ and Grades wise injures

Organ injury	Grade of injury					Total
	I	II	III	IV	V	
Pancreas	7(25%)	10(35.7%)	7(25%)	3(10.7%)	1(3.4%)	28(25.45%)
Duodenum	5(16.67%)	15(50%)	8(26.27%)	2(6.8%)	0	30(27.27%)
Kidney	4(11.8%)	10(29.4%)	10(29.4%)	6(17.6%)	4(11.8%)	34(30.91%)
Pancreatoduodenal	13(72.2%)	3(16.67%)	1(5.6%)	1(5.5%)	0	18(16.36%)
Total	28(25.45%)	37(33.64%)	27(24.56%)	12(10.9%)	6(5.4%)	110

Table 2: Stratification for gender

Mode of injury	Male	Female	Total
Road accidents	53(82.81%)	11(17.19%)	64(58.18%)
Fall from height	24(82.76%)	5(17.24%)	29(26.36%)
Physical assault	15(88.24%)	2(11.76%)	17(15.46%)
Total	**92(83.64%)**	**18(16.36%)**	**110**

P value=0.857

Table 3: Stratification for Age

Mode of injury	Age group			Total
	12-35 years	36-50 years	51-70 years	
Road Accident	38(59.38%)	21(32.81%)	5(7.8%)	64(58.18%)
Fall from Height	17(58.62%)	8(27.59%)	4(13.8%)	29(26.36%)
Physical Assault	14(63.64%)	4(18.18%)	4(18.18%)	17(15.46%)
Total	87(58%)	46(30.67%)	17(11.33%)	

P value=0.546

DISCUSSION

Retroperitoneal organ injuries following blunt abdominal trauma haveremained a challenge to surgeons with an ever-present desire to improve theearly diagnosis and the outcome of the management. Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups[11].

In the our study, male subjects were more victim of abdominal trauma as compare to female subjects which is in agreement with study by Khan et al[6]. Young males, most of all those aged 20 to 30 years, have been reported to be the most frequent victims.Vehicle accidents was the most common cause of blunt abdominal trauma. The second most common cause was fallingfrom a height and the third was Physical assault. Our study showing regarding mode of injury, total 58.18%subjectssuffered from RoadAccidents, 26.36%had a history of fall from height whereas 15.45% subjects had a history of Physical Assault.Some other studies also reported road accidents, interpersonal violence and falls from height as main causes of blunt abdominal trauma[12,13]. Ahmed et al also reported trauma as the leading cause of mortality in subjects having age 1-44 years[9]. Blunt abdominal trauma accounted for 79% cases and males are more victim of blunt abdominal trauma as compare to female. In one study by Bhattacharjee et al[14] blunt abdominal trauma is morefrequent in males aged 21-30 years; the majority of patients were injured in automobile accidents.

In our study duodenum was injured in 27.27% subjects. A study by Zayd Fudim et al[15] indicated thatmost of patients with vertical deceleration injuries (i.e., falls from heights), only 5.9% had blunt abdominal injuries.Consistent withthese results, studies by Bhattacharjee et al[14] and Antonacci et al[16] injuries to theduodenum account for approximately 3% to 5% of abdominal trauma. Bluntabdominal trauma as a result of direct blow to the epigastrium, mainly due toroad traffic accident and sports trauma (bicycle handle injury), accounts for 25%of all duodenal injuries as shown by Chinnery et al and Girgin et al[17,18].

In our study kidney damage was noted in 30.91% subjects. Grad I injury was seen in 11.8% subjects, Grade II, III, IV and V injuries were seen 29.4%, 29.4%, 17.6% and 11.8% respectively. Similar findings were reported by Wong et al,[19]89 cases of Grade 2 renal injuries were recordedwith blunt trauma accounting for 94.4%; 57.3% were Grade 2 injuries, 12.4%Grade 3, 25.8% Grade 4, and 4.5% Grade 5. MVAs and motorcycle accidentswere the most common cause of injury, accounting for 48.3% of all renalinjuries.

In our study pancreas was injured in 25.45% patients, whereas 16.36% had pancreato-duodenal injuries. Traumatic injuries of the pancreas occur after bluntabdominal traumas or penetrating wounds with a ratio of 3:1[16]. These arecharacterized by high morbidity and mortality with a 45-50% combined rate asreported in the reviewed literature[17,20]. Pancreatic injuries occur in 3-15% of allabdominal trauma. Isolated traumatic injuries of the pancreas are uncommon; in 50-98% of cases they are associated with injuries to other organs, such as spleen,liver, kidney, large/small intestine, veins or arteries.Due to the retroperitoneallocation of the pancreas, isolated pancreatic injury occurs in less than 5% ofcases of major blunt abdominal trauma.[21]

CONCLUSION

In this study road accidents were the most common cause of blunt abdominal trauma and most of the subjects were found with injury of kidney.This study highlights the need for prioritizing a public healthapproach to abide by traffic laws and violence prevention in Pakistan.Results of this study also

reveals that male subjects were more victim of blunt abdominal trauma as compare to female subjects and age group 12-35 years was the most common age group of cases with blunt abdominal trauma.

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